City of Austin Invasive Plant Management Cost Approximate Estimates

Project	Project Costs (incl. volunteers)	Staff Costs
Austin Energy- Decker Lake Hydrilla Removal	$145,000.00	$12,000
PARD- Barton Creek Greenbelt (annually)	$16,000.00	$1,000
PARD- Indiangrass Wildlife Sanctuary (ongoing)	$10,000.00	$2,945
PARD-Blunn Creek Nature Preserve	$37,182.00	
PARD- Zilker Nature Preserve	$49,514.00	
PARD- Mayfield Nature Preserve	$47,894.00	
PARD- Commons Ford Park (3 yr project ongoing 2010-2013)	$60,930.00	
PARD- West Bouldin Creek Greenbelt (5 yr project ongoing 2008-2013)	$6,923.00	
PARD- Nicholas Dawson Park	$852.00	
PARD- Urban Forestry		$35,000
Watershed Protection- Lady Bird Lake (5 yrs)	$250,000.00	$30,000
Watershed Protection- Hydrilla Removal (10 yrs, ongoing)	$776,000.00	$164,000
Watershed Protection- Pease Park	$400,000.00	
Water Utility-WCD-BCP (annually)		$69,000
Water Utility-WCD-WQPL - Invasive Mapping (Onion Creek-woody exotics)	$400.00	$100
Water Utility-WCD-WQPL - Invasive Mapping (J-17 tract- Malta star thistle)	$1,320.00	$300
Water Utility-WCD-WQPL - Invasive Mapping (Ashe juniper)	$1,312,280.00	
Water Utility-WCD-WQPL - Invasive Mapping (Lancaster- Mesquite)	$725.00	$1,280
Water Utility-WCD-WQPL - Invasive Mapping (Lloyd Tract-Mesquite)	$1,000.00	$800
Water Utility-WCD-WQPL - Invasive Mapping (Orr Tract-Mesquite)	$570.00	$640
Water Utility-WCD-WQPL - Invasive Mapping (Stenis Tract-woody exotics)	$150.00	$2,800
	$3,116,740.00	$319,865

Total	**$3,436,605**

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Energy **Contact:** Eric Stager

Invasive Plant Project/ Program Name: Decker Lake Integrated Pest Management Plan

Location(s): Decker Lake (Lake Walter E. Long)

Target Species: Hydrilla, filamentous algae.

Existing Vegetation Surveys or Mapping: _x___ Yes ____ No
If yes, please describe: Conduct aquatic vegetation surveys at least twice per year.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

Surveys of Decker Lake for hydrilla are conducted 2 – 4 times per year by internal staff, sometimes assisted by a consultant. If hydrilla reaches a density that poses a risk to Decker Power Plant operations (i.e. begins to clog the cooling water intake), or impacts the Decker Lake Park operations (may pose a safety risk to swimmers), a decision is made on whether a hydrilla treatment is needed for a large portion of the lake, or if a smaller “spot-treatment” would be adequate.

Treatment involves application of herbicide, primarily fluridone, but also sometimes endothall is used when a spot treatment is sufficient. The herbicide is applied by a licensed applicator using a combination of internal and contracted resources. The Park is closed to the public during any application.

Treatment is only conducted when absolutely necessary, as established in the Decker Lake IPM. The last major hydrilla treatment occurred in 2000.

Cost for a typical year of monitoring is about $5,000 of contractor expenses, and approximately 50 man-hours of internal staff time per year (approx. $2,000).

For a major hydrilla treatment, cost of the herbicide and contractor expenses is about $125,000, plus approximately 100 man-hours of internal staff time (approx. $4,000).

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Watershed Protection **Contact:** Mary Gilroy

Invasive Plant Project/ Program Name: Lake Austin Hydrilla

Location(s): Lake Austin and Lady Bird Lake

Target Species: The aquatic exotic plant, Hydrilla (*Hydrilla verticillata*), whose dense growth has limited navigation and recreation, damaged water intake structures and caused significant public safety concerns on Lake Austin.

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe:
Texas Parks and Wildlife Department conducts quarterly aquatic vegetation surveys on Lake Austin. These surveys show the coverage in acres of each type of aquatic plant, including natives and non-natives. The maps are GIS files that are converted to pdf files and are provided to the City of Austin along with a summary of each plant type and acreage.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

First documented in 1999, hydrilla grew to over 320 acres on the 1600 acre Lake Austin by July 2000. Hydrilla control has been a cooperative effort between the City of Austin, TPWD, LCRA and citizen stakeholders. It is anticipated that hydrilla will not ever be eradicated but will require ongoing monitoring and control to limit its impact on the lake and its users. In addition, native vegetation restoration work will require ongoing maintenance.

Control efforts include biennial winter drawdowns of Lake Austin to dry out the vegetation and stocking sterile grass carp to eat the plants. The drawdowns, done cooperatively with LCRA, are conducted with no cost for refill water, but LCRA requires a power transfer from Austin Energy (no more than 300 MW) for lost generation during the drawdown. Grass carp stockings are based on hydrilla coverage from TPWD's vegetation surveys, and require permits from that same agency. Since the first fish stocking in 2003, 15,000 fish have been stocked for a total cost of $96,000. Over the course of the project, hydrilla coverage has dropped from a maximum of 320 acres in July 2000 to less than 20 acres in August 2007. Acreage has varied since then, with a peak of over 300 acres in September 2009, requiring an additional stocking of fish.

In addition to control efforts the City has worked with Lewisville Aquatic Ecosystem Research Facility (a branch of the USACE) since 2004 to establish native plant communities on both Lake Austin and Lady Bird Lake to provide beneficial vegetation to replace hydrilla and resist new infestations as well as to provide better habitat for fish and other aquatic wildlife. Founder colonies have been planted at 20 sites in both lakes, with cages and pens used to limit the loss of plants to grazing by waterfowl and

turtles. These colonies should provide seeds and fragments to spread the plants throughout the lake. As this spread increases, maintenance costs will drop as fewer replacement plants are needed. Since inception, this project has cost approximately $490 K.

Staff time on this effort has been considerable, and varies from year to year, with a decreasing commitment needed as hydrilla control has proven successful. Estimated staff costs for the past 10 years of hydrilla control and restoration is $156 K.

Total project cost to date	
Grass Carp	$ 96,000
Restoration work	$ 490,000
Staff cost estimate	$164,000
	$750,000

$190,000 in future CIP funding is available for this project through 2013; this will include ongoing restoration efforts as well as additional grass carp stockings if needed.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Watershed Protection Department **Contact:** Mary Gilroy

Invasive Plant Project/ Program Name: Lady Bird Lake Riparian Invasives

Location(s): Lady Bird Lake riparian zone

Target Species: Initial species- *Arundo donax*

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe:
WPD has created a GIS map of estimated coverage. Texas Invaders volunteers are currently collecting GPS data on Arundo locations which WPD will use to create a more accurate GIS map to direct control efforts.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The goal of this project is to assess the extent of invasive species in Lady Bird Lake riparian zone, then develop and implement control methods and re-vegetate the areas with native plants. The initial focus will be on giant cane, *Arundo donax*, but control of other invasive species will be undertaken with remaining funds. *Arundo donax* is a tall, perennial grass that can grow to over 20 feet in height with tough, fibrous roots that penetrate deeply into the soil. It can quickly invade new areas and form pure stands at the expense of other species. Once established, *Arundo* often out competes native vegetation, choking riversides and stream channels, interfering with flood control, increasing fire potential, and reducing habitat for wildlife. Its presence in Lady Bird Lake's riparian zone has not been monitored over time, so the extent and amount of spread is currently unknown.

Once mapped (as described above in the Existing Vegetation Surveys/Maps), plants will be removed using an IPM approach, including all appropriate options- biological, chemical and mechanical removal. Chemical control is estimated at $300/acre, but could be problematic due to proximity to the lake and canopy vegetation. Mechanical control can cost from 5 to 20 times more than chemical control, but it is anticipated that volunteers and labor sources such as Austin Youthworks will help control these costs. Biocontrol is a promising option, and while currently not available, as the insect is still being researched by USDA, could be an important opportunity for cost-sharing with both USDA and TPWD, already involved in *Arundo* biocontrol studies in Austin.

Re-vegetation with native plants will be a critical follow up to plant removal, again utilizing outside labor forces described above. Cost of the project is dependent on the extent of invasive coverage. The project currently has a five year timeline and $250,000 in CIP funding. Staff time is estimated at $30,000 over the project timeline.

Current City of Austin
Invasive Plant Programs & Projects Template

Prepared by John Gleason, 5/17/2010

Department: Watershed Protection Dept. **Contact:** John Gleason

Invasive Plant Project/ Program Name: Pease Park Riparian Restoration

Location(s): Shoal Creek riparian zone within Pease Park

Target Species: Primary species to be targeted are Ligustrum, Nandina, Giant Cane, Bamboo, Chinese Tallow, and Chinaberry

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe: An inventory was taken in 2009 that mapped existing locations of invasive plant colonies immediately adjacent to Shoal Creek within the boundaries of Pease Park from 24th street to 15th street.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The invasive plant removal efforts will be conducted in association with a proposed Watershed Protection Department project that will integrate stormwater treatment, stream restoration and riparian restoration goals. The start date for the integrated project has not yet been established, but it is hoped that it could begin in 2011 and be implemented over a period of 2 years or more. Preliminary design for these drainage improvements was completed by a consulting team led by PBS&J in 2009. Final design plans and contract documents (that will describe the proposed improvements in detail) have not yet begun. WPD staff involved in the project so far have included Mike Kelly, Pat Hartigan, Morgan Byars, and John Gleason. The riparian restoration portion of the project will include revegetation of the areas affected by the plant removal efforts. Removal methods will implement an integrated pest management (IPM) approach. Physical removal of the pest species is preferred however herbicides may be used as necessary. Potential costs for invasive plant removal is anticipated to be in the range of $200,000 to $400,000. It is likely that staff will spend between 50 and 100 hours on these eradication efforts. Contractors are likely to be the source of labor and will spend several thousand hours on invasive plant removal.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Mapping exotic woody species on Water Quality Protection Lands

Location(s): Onion Creek management unit

Target Species: all exotic woody species

Existing Vegetation Surveys or Mapping: ____ Yes ____ No
If yes, please describe:

Brief Description of Project/ Program:

- Sampling protocol

Volunteers marked individual woody plants or groups of woody plants with GPS. Waypoints were then mapped into a GIS.

- project size – 2,300 acres
- project time frame – two years
- dedicated staff - 1
- complete cost of project = $500
    - staff salary - $100 for volunteer management
    - volunteer hours – 1,500
    - other costs

    GPS units - $400

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Water Quality Protection Lands

Location(s): J17 tract

Target Species: Malta star thistle

Existing Vegetation Surveys or Mapping: __x__ Yes ____ No
If yes, please describe: Aerial mapping (GIS) with verification on the ground

Brief Description of Project/ Program:

- Sampling protocol

No structured monitoring protocol specific for this project. Qualitative assessment and monitoring on the ground. Records (pesticide application, maps of treated areas) kept on paper and in GIS. Other formalized, quantitative long-term vegetation monitoring will monitor this species at much lower resolution.

- Removal methods

Hand pulling.

- other BMPs

Soil disturbance minimized. Prescribed fire management.

- project size

0.3 acres

- project time frame

2 work days

- 1 dedicated staff

10 Environmental Corps members

- complete cost of project = $1,620
    - staff salary

      $300
    - contractor costs

      $1320

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Water Quality Protection Lands

Location(s): multiple

Target Species: Ashe juniper

Existing Vegetation Surveys or Mapping: x Yes ____ No
If yes, please describe: Qualitative aerial (GIS) and ground evaluation determine areas of high priority. Formalized quantitative surveys estimate tree density in various size classes. These surveys are then incorporated into our long-term vegetation monitoring protocols that monitor change in vegetation communities in response to multiple restoration treatments across the whole of the WQPL.

Brief Description of Project/ Program:

- Sampling protocol

800-foot transects are established in areas of high priority and prior to initiation of mechanical treatment. Within eight 0.10-acre circles along the transect, trees within various size classes are counted. This data is used to estimate tree density, describe size structure within the population, and over-time multiple observations will measure change in the population over time.

This protocol is also incorporated as part of our long-term vegetation monitoring that, in addition to the above metrics, estimates and tracks other components of the vegetative community such as canopy cover and composition, ground cover, and herbaceous species composition.

- Removal methods

Mechanical shearing, mechanical grinding (mastication), or manual cutting with chainsaws. Juniper slash is compressed and left in place. Follow-up prescribed burns invigorate native grasses, further decrease brush dominance and are critical in beginning the ecological restoration process of the landscape. Native grasses are additionally seeded following burns.

- other BMPs

Soil disturbance minimized. Prescribed fire management. Over-seeding with native grasses.

- project size

Various. 2,476 acres treated since creation of WQPL in 1998.

- dedicated staff

Mechanical cutting is predominantly contracted. Staff time to oversee projects and manage contracts.

- complete cost of project = $395-530/acre ($978,020 to $1,312,280 to date)
    - staff salary

    0.25 hours to 1 hour per acre = $5-20/acre
    - other costs

mechanical contract labor - $250-350/acre
prescribed fire - ~$100/acre
native grass seeding - ~$40-60/acre

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Water Quality Protection Lands

Location(s): Lancaster tract

Target Species: mesquite

Existing Vegetation Surveys or Mapping: x Yes ____ No
If yes, please describe: Aerial mapping (GIS) with verification on the ground

Brief Description of Project/ Program:

- Sampling protocol

No structured monitoring protocol specific for this project. Qualitative assessment and monitoring on the ground. Records (pesticide application, maps of treated areas) kept on paper and in GIS.

- Removal methods

Staff used foliar application method with a mixture of 1% a.i. triclopyr and 1% a.i. clopyralid. Spray equipment mounted on a 2-seater ATV (similar to a Kawasaki Mule).

- other BMPs

Soil disturbance minimized. Prescribed fire management.

- project size

36 acres

- project time frame

8 work days

- dedicated staff

1

- complete cost of project = $2,005
    - staff salary
      $1,280
    - other costs – mileage, equipment, herbicide
      $725

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Water Quality Protection Lands

Location(s): Onion Creek management unit, Lloyd 236 tract

Target Species: mesquite

Existing Vegetation Surveys or Mapping: x Yes ____ No
If yes, please describe: Aerial mapping (GIS) with verification on the ground

Brief Description of Project/ Program:

- Sampling protocol

No structured monitoring protocol specific for this project. Qualitative assessment and monitoring on the ground. Records (pesticide application, maps of treated areas) kept on paper and in GIS. Other formalized, quantitative long-term vegetation monitoring will monitor this species at much lower resolution.

- Removal methods

Staff treated individual plants using basal bark application method with Remedy RTU herbicide.

- other BMPs

Soil disturbance minimized. Prescribed fire management.

- project size

110 acres

- project time frame

5 work days

- dedicated staff

1

- complete cost of project = $1,800
    - staff salary
      $800
    - volunteer hours
      0
    - other costs – mileage, equipment, herbicide
      $1,000

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Water Quality Protection Lands

Location(s): Onion Creek management unit, Orr tract

Target Species: mesquite

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe: Aerial mapping (GIS) with verification on the ground

Brief Description of Project/ Program:

- Sampling protocol

No structured monitoring protocol specific for this project. Qualitative assessment and monitoring on the ground. Records (pesticide application, maps of treated areas) kept on paper and in GIS. Other formalized, quantitative long-term vegetation monitoring will monitor this species at much lower resolution.

- Removal methods

Staff used foliar application method with a mixture of 1% a.i. triclopyr and 1% a.i. clopyralid. Spray equipment mounted on a 2-seater ATV (similar to a Kawasaki Mule).

- other BMPs

Soil disturbance minimized. Prescribed fire management.

- project size

17 acres

- project time frame

4 work days

- dedicated staff

1

- complete cost of project =
    - staff salary

      $640
    - volunteer hours

      0
    - other costs – mileage, equipment, herbicide

      $570

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Water Utility **Contact:** Matt McCaw

Invasive Plant Project/ Program Name: Water Quality Protection Lands

Location(s): Stenis Tract

Target Species: Ligustrum, Chinaberry, Chinese tallow, other exotic woody species

Existing Vegetation Surveys or Mapping: x Yes ____ No
If yes, please describe: Aerial mapping (GIS) with verification on the ground

Brief Description of Project/ Program:

- Sampling protocol

No structured monitoring protocol. Qualitative assessment and monitoring on the ground. Records (pesticide application, maps of treated areas) kept on paper and in GIS.

- Removal methods

Volunteers hand-pulled small plants. Staff cut-stump treated larger plants with Habitat herbicide (14% active ingredient).

- other BMPs
- project size

14.7 acres

- project time frame

9 work days

- dedicated staff

2

- complete cost of project = $2,950
    - staff salary

    $2,800
    - volunteer hours

    64
    - other costs – mileage, equipment, herbicide

    $150

Current City of Austin
Invasive Plant Programs & Projects Template

Department: AWU-WCD-BCP **Contact:** Scott Rowin

Invasive Plant Project/ Program Name: Invasive Plant control throughout the Balcones Canyonland Preserve

Location(s): 13,600 acres of the City owned BCP, western Travis County

Target Species: Nandina, China Berry, KR bluestem, Bermuda grass, ligustrum, tree of Heaven, Chinese tallow, Pyracantha, Photinia, etc.

Existing Vegetation Surveys or Mapping: __x_ Yes ____ No
If yes, please describe:
Some of the preserve has been mapped and the information is provided to Lady Bird Johnson Wildflower center to track through their Invaders of Texas program. Much of the preserve remains to be mapped. Most mapping is done by volunteers.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

Invasive plant populations are typically mapped with a GPS unit following the protocols established by the Invaders of Texas program. This information is provided to Lady Bird Johnson Wildflower Center to track and QA/QC. Removal is done by BCP staff and volunteers and is typically done by hand, but herbicides may be used for larger plants. There is no staff specifically dedicated to invasive plant removal. Rather, this is a year round activity and is considered a normal part of staff's day to day duties. Assuming approximately 10% of BCP staff's time is spent related to invasive plant removal, the annual cost in salaries and benefits would be approximately $69,000. Volunteers contribute approximately 550 hours for mapping and removal annually. While not included above, the BCP spends a considerable amount of time and money controlling feral hogs.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Parks and Recreation **Contact:** Rene' Barrera

Invasive Plant Project/ Program Name: Blunn Creek Invasive species Eradication Project

Location(s): Blunn Creek Nature Preserve

Target Species: Japanese Privet, Chinese privet, Chinese tallow, Chinaberry, Pyracantha, Loquat, Paper Mulberry, Japanese honeysuckle, Johnson grass, Annual Bastard Cabbage, Nandina, Taiwanese photinia, Red tipped photinia, Brazillian vervain, King Ranch Bluestem

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe: Three belted transects done with Texas State University in 2005 determined species composition to be 56% non native invasive. We are currently surveying the entire 38.8 acres of the preserve with the Invaders group that we have trained.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The Blunn Creek Project is in its third year and we have completed approximately eight acres. Priority has been placed first on restoring functionality to the riparian corridor of Blunn Creek. A second priority has been placed on reestablishing natural springs at four localities. Removal of invasive spp. has not seen robust native regeneration due to prior over grazing of site (former dairy farm) and loss of the indigenous native seed bank. Eradication efforts are timed with replacement of native grasses, shrubs and tree species. Stream banks are currently being revegetated with a diverse assemblage of native sedges, grasses and wetland species. At this time we have completed 100 linear feet. This will assist in future recruitment of dispersed seeds from mature riparian trees that are established along the watershed.

One staff person manages the entire project and drafts or ghost writes grants to hire outside professionals to conduct invasive removal, herbicide treatments and brush management. Much of brush management has been done on site. A large percentage of work is carried out by St Edward's University interns, students, volunteers, residents and non profit groups. Funds have been contributed by the Blunn Creek Partnership, Austin Parks Foundation and Keep Austin Beautiful. The Urban Forestry Grant program has also provided funding. The Austin Biodiversity Greenhouse has contributed native plants to the project.

Removal of invasives: 8%
Revegetation of natives:4.5 %
Biomass processed: Fourteen 40 cubic dumpsters of brush
Staff salary: Not Included

Friends Groups: Donations/ grants: $21,892.92
Volunteer labor: $15, 288.67

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Parks and Recreation **Contact:** Rene' Barrera

Invasive Plant Project/ Program Name: Mayfield Nature Preserve Invasive Species Eradication Project

Location(s): Mayfield Nature Preserve

Target Species: Japanese Privet, Chinese privet, Chinese tallow, Chinaberry, Paper Mulberry, Japanese honeysuckle, Johnson grass, Annual Bastard Cabbage, Nandina, Taiwanese photinia, Red tipped photinia, King Ranch Bluestem, Elephant ear, Ruellia, Asian holly fern, Asian jasmine. English Ivy, Cat's claw, Chinese pistache, Bermuda grass, Vinca

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe: Currently mapping 22 acres as part of Invaders program.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The Mayfield Nature Preserve Project is in its second year and we have completely removed approximately twenty two acres of invasive ligustrum from the entire preserve. Priority has been placed first on restoring functionality to the riparian corridor of Barrow creek and Taylor slough. A second priority has been placed on reestablishing native diversity throughout the ecosystem. Eradication efforts are timed with replacement of native grasses, shrubs and tree species. Stream banks are currently being revegetated with a diverse assemblage of native sedges, grasses and wetland species. At this time we have completed thirty linear feet. This will assist in future recruitment of dispersed seeds from mature riparian trees that are established along the watershed.

One staff person manages the entire project and drafts or ghost writes grants to hire outside professionals to conduct invasive removal, herbicide treatments and brush management. Much of brush management has been done on site. A large percentage of work is carried out by students, volunteers, residents and non profit groups. Funds have been contributed by the Friends of Mayfield Nature Preserve, Austin Parks Foundation and Keep Austin Beautiful. The Urban Forestry Grant program has also provided funding. The Austin Biodiversity Greenhouse has contributed native plants to the project.

Removal of invasive ligustrum: 95% and 5 % seed bank remains
Revegetation of natives: 10 %
Biomass processed: twelve 40 cubic dumpsters of brush
Staff salary: Not Included
2010 Target species Chinese pistache (on hold)
Friends Groups: Donations/ grants: $22,892.92 (2009)
Volunteer labor: $25,000 (2009)

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Parks and Recreation **Contact:** Rene' Barrera

Invasive Plant Project/ Program Name: Zilker Nature Preserve Invasive Species Eradication Project

Location(s): Zilker Nature Preserve

Target Species: Japanese Privet or Ligustrum, Chinese privet, Chinese tallow, Chinaberry, Paper Mulberry, Japanese honeysuckle, Johnson grass, Annual Bastard Cabbage, Nandina, Taiwanese photinia, Red tipped photinia, King Ranch Bluestem, Asian holly fern, English Ivy, Cat's claw, Bermuda grass, Vinca, Tree of Heaven, Brazillian vervain, Loguat, Paper Mulberry

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe: Currently mapping 60 acres as part of Invaders program.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The Zilker Nature Preserve Project is in its first year and we have removed approximately forty eight acres of invasive ligustrum from the entire preserve. Priority has been placed first on restoring functionality to the riparian corridor of Eanes creek (Dry Creek). A second priority has been placed on reestablishing native diversity throughout the ecosystem. Timing of removals has resulted in natural regeneration of its native seed bank. Invasive seed banks are being culled as part of our on going eradication efforts. Eradication efforts are also timed with manual dispersal of native seeds and with replacement of native grasses, shrubs and tree species. Stream banks are currently being reseeded/ revegetated with a diverse assemblage of native sedges, grasses and wetland species.

One staff person manages the entire project and drafts or ghost writes grants to hire outside professionals to conduct invasive removal, herbicide treatments and brush management. Much of brush management has been done on site. A large percentage of work is carried out by EcoTEXAS, students, volunteers, residents and other non-profit groups. Funds have been contributed by EcoTEXAS, Friends of Zilker Nature Preserve, Austin Parks Foundation and Keep Austin Beautiful. The Urban Forestry Grant program has also provided funding. The Austin Biodiversity Greenhouse has contributed native plants to the project.

Removal of invasive ligustrum: 70% and 10 % seed bank remains
Revegetation of natives: 5 %
Biomass processed: twenty two 40 cubic dumpsters of brush
Staff salary: Not Included
2010 Target species Ligustrum
Friends Groups: Donations/ grants: $22,000.00
Volunteer labor: $27,514

Current City of Austin
Invasive Plant Programs & Projects Template

Department: PARD **Contact:** Joan Singh

Invasive Plant Project/ Program Name: Commons Ford Ranch Prairie Restoration Project

Location(s): 614 N. Commons Ford Rd.

Target Species: King Ranch Bluestem, Malta star thistle, Chinese Tallow trees

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe:

Map attached. Initial Bird surveys have been completed. Vegetation surveys will start June 3-6, 2010.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

Native prairie restoration project: Removal of invasives on a 40 acre tract and planting of native grasses and wildflowers for preservation of habitat and wildlife. Project to take place over a three year period (2009-2012).

Partners of this project:
Austin Parks and Recreation Department
Austin Water Utility (AWU) Wildland Conservation Division, Balcones Canyonlands Preserve
Native Prairies Association of Texas
Travis Audubon Society
Austin Parks Foundation
Texas Parks and Wildlife Department
Natural Resources Conservation Service
Commons Ford Prairie Restoration Organization

commons ford prairie full park map.pdf

COMMONS FORD
PRAIRIE RESTORATION PROJECT
INITIAL BUDGET

Resource analysis (1) $2,500
Use and treatment history
Soil content
Vegetative composition
Project site boundaries
Identification of on-site seed sources
Development and preparation of restoration plan (1) $2,000
Consulting services throughout the project (2) $10,000
100 hours @ $100/hour
Seed costs (3) $32,500
Herbicide (4) $1,000
Miscellaneous costs (5) $5,000
Total initial budget $53,000
Glyphosate (6) $5,000
Volunteer Hours to date 275@ $10.65/hr- $2,930
Total modified budget $60,930

(1) Native Prairies Association of Texas (NPAT) will be engaged to conduct the resource analysis and develop and prepare the restoration plan.
(2) Based upon estimates and quotes obtained from NPAT. Total amount based upon estimation of consultation time needed from completion of plan through post-planting maintenance period.
(3) Based upon estimates received from Native American Seed Company for Blackland Prairie Mix at double seeding rate and Native Trail Mix at regular seeding rate.
(4) Herbicide for treatment of small mesquite for removal purposes (Garlon or Remedy)
(5) It is anticipated that many aspects of implementing the plan including prescribed burn(s), seedbed preparation and seed planting will be carried out without charge through resources available within Austin Parks and Recreation Department, Balcones Canyonlands Preserve, volunteers and gratis assistance through other organizations and government agencies. Miscellaneous costs are included, however, in the event that (i) gratis assistance is less than expected or (ii) unforeseen costs arise.
(6) A final determination as to whether herbicide treatment will be required to effectively remove invasives will not be made until other aspects of the project have commenced. Estimation is based upon two applications on entire tract.

The project will raise funds through grants and donations. The Parks and Recreation Department will furnish equipment and personnel, Balcones Canyonlands Preserves will partner with PARD for technical advice, protocols, and other resources. The restoration will take a least three years and afterward a Management Plan will be put into effect for ongoing maintenance.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Parks and Recreation **Contact:** Walter Passmore

Invasive Plant Project/ Program Name: Urban Forestry Program

Location(s): All City of Austin property

Target Species: Identified exotic-invasive species

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe: Forest inventory information and partner data bases such as the Ladybird Johnson Wildflower Center, Invaders of Texas tracking system

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

Continuous forest inventory sampling is based on i-Tree protocol. Removal methods are prescribed as appropriate to the vegetation targeted. Invasive species management is described on a site and species specific basis within individual site (park) management plans, Adopt-a-Park agreements, public tree care permits (administrative approval by the Urban Forester), and other Comprehensive Urban Forest Plan documents. Invasive species management is a perpetual commitment for the Urban Forestry Program working in conjunction with the Urban Forestry Board and under the authority of Chapter 6 of City of Austin Code. The Urban Forestry Program currently has 22 full time staff members and a budget of $1.4 million to manage 16,680 acres of park land, more than 2,000 miles of trees and vegetation adjacent to streets, and provides professional consulting services to all City of Austin Departments on an as requested basis.

PARD Forestry expenditures of resources on specific invasive plant controls is in the form of assistance to Austin Nature Preserves and with the annual clean up days with Keep Austin Beautiful, Austin Parks Foundation, and United Way, approximately 15 days each year, for an estimated cost of $35,000 (2.5% of budget).

Current City of Austin
Invasive Plant Programs & Projects Template

Department: PARD – GOLF **Contact:** Tom Moses

Invasive Plant Project/ Program Name: NO PLAN IN PLACE

Location(s): Entrance road and throughout course

Target Species: Ligustrum & Nandinas

Existing Vegetation Surveys or Mapping: ____ Yes X No
If yes, please describe:

_____

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Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

Lions Golf Course
PARD Golf has no plan for removal of the invasive woody species on the Lions G.C. due to the fact that the course is owned by the University of Texas. Due to the uncertain future of the Contract / Lease between the City and the University, there will be no removal, remodel or any renovations performed by Golf regarding the invasive species. This type of activity would have to be cleared by the University. If the lease between the City and the University ends, the University has development plans for the property and invasive tree removal may be addressed by the University at that time.

Jimmy Clay, Roy Kizer, Hancock, Morris Williams Golf Courses
No invasive plant problems in golf courses proper. Outer boundaries of the courses along the creek banks are full of Chinaberries and other invasive trees, but PARD is not inclined to perform invasive eradication because these trees continue to secure creek bank stability and buffer zones around the golf courses.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: Parks and Recreation **Contact:** Rene' Barrera

Invasive Plant Project/ Program Name: Indiangrass Wildlife Sanctuary Invasive Species Eradication Project

Location(s): Indiangrass Wildlife Sanctuary

Target Species: Chinese tallow, Chinaberry, Japanese honeysuckle, Johnson grass, Annual Bastard Cabbage, King Ranch Bluestem, Bermuda grass, Vitex, Ashe Juniper and Eastern Red Cedar

Existing Vegetation Surveys or Mapping: ____ Yes X No
If yes, please describe:.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The Indiangrass Wildlife Sanctuary Project (200 acre) is in its fifth year of brush management and we have removed approximately 18 acres of invasive native Ashe juniper and Eastern Red Cedar from the Blackland prairie ecosystem. Priority has been placed on reestablishing functionality to the Tallgrass prairie biome. Prescribed burns and slow duration grazing are desirable ecosystem services that are missing from restoration efforts due to lack of resources. This would enhance the reestablishment of native diversity throughout the ecosystem and reduction of prairie "duff". The last prescribed burn was conducted by staff in 1997. Much of brush management has been left on site. The prairie grasses are literally dying of suffocation due to loss of grazing and periodic fire. Invasive woodies are being culled as part of our on going eradication efforts.

One staff person manages the entire project and in 2009 we were first runner up for a $100, 00.00 Impact Austin grant. Funds would have been applied to hire outside professionals to conduct invasive removal, prescribes burn, herbicide treatments and brush management and provided five local schools with educational opportunities. A large percentage of work is carried out by Native Prairies Association of Texas, students, volunteers, residents and other non-profit groups. No funds have been generated other than volunteer labor. The Austin Biodiversity Greenhouse has contributed native plants to the project.

Removal of invasive cedar: 15 %
Revegetation of natives: 5 %
Biomass processed: Five 40 cubic dumpsters of brush
Staff salary: Not Included
2010 Target species Ashe Juniper and Cedar, K R Bluestem
Friends Groups: 0.00
Volunteer labor: $10,000

Current City of Austin
Invasive Plant Programs & Projects Template

Department: PARD **Contact:** Joan Singh

Invasive Plant Project/ Program Name: West Bouldin Greenbelt

Location(s): 1200 S. 6th St

Target Species: Chinaberry, Nandina, Ligustrum

Existing Vegetation Surveys or Mapping: X Yes ____ No
If yes, please describe:

Ecological Assessment and Ecological Restoration Master Plan completed by Lady Bird Johnson Wildflower Center August 2009.

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

Removal of invasive plants and restoration with native species

PARD is partnered with the West Bouldin Neighborhood Association to implement this project which does include significant invasive plant removal. The budget plan has not been developed at this time, but the neighborhood association has completed several months of regularly scheduled work days to remove invasives and some revegetation has been accomplished. Discussions are open for this area to be restored to bottomland hardwood forest or open savannah. PARD is working with NA to develop long-range plans and effective controls for permanent invasive controls. Some mitigations funds are available from an AWU utility project.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: PARD **Contact:** John Wright

Invasive Plant Project/ Program Name: Barton Creek Greenbelt

Location(s): Barton Creek Greenbelt from Zilker Trailhead to MoPac

Target Species: Ligustrum, Chinaberry, Nandina

Existing Vegetation Surveys or Mapping: x Yes ____ No
If yes, please describe: All areas within 300 yds of Barton Creek within boundaries of Barton Creek Greenbelt between the Zilker Trailhead and MoPac

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

The area described above is infested to varying degrees with mainly Ligustrum, with some Chinaberry and Nandina. Although the infestation may extend beyond the 300 yd limit, it is primarily concentrated within this zone and this is the area of focus. The sampling protocol consisted of extensive examination of the entire area which showed the entire area to be infested with invasives to a larger (complete domination of an area by invasives) or smaller (numerous individual invasives growing among desirable vegetation) extent. Obviously, with an area this large, we will be working in small areas within the larger area which will be determined before each work day depending on the number of volunteers and workers available for that day.

Our methods involve removal of small invasives with a weed wrench, cutting down larger trees with loppers, handsaws, or chainsaws and treating the stumps with Glyphosate to prevent re-sprouting. The cut trees are windrowed and reduced by stacking them in windrows, then dragging a chainsaw through the row every 6” or so to breakdown small branches and allow the pile to settle into as compact a mass as possible. This helps reduce erosion, as well as returning the organic matter to the soil where it was generated. Additionally, some brush may be used to “brush off”, or close unauthorized social trails. Areas where the soil is left bare due to shading by invasives is seeded with a cover crop such as inland sea oats, millet, or cowpea to get quick re-vegetation as well as adding additional organic matter and nitrogen. As the cover crop dies back, the area will begin to recover through the process of biological succession, the natural restoration of an area through a series of plant cycles generated from native seed already in the soil. Typically this will start with the tall quick growing tap rooted annuals, progresses to annual grasses, then to smaller broadleaved annuals, and finally to a stable climax community of annual and perennial grasses and broadleaved plants. This process typically takes from 5 to 10 years depending on climate and other factors. During this time, the area will be monitored to spot and remove any returning invasives. This is preferable to attempting to replant mature native species as there are no resources to care for young plants in the area, and succession will insure the area is re-vegetated with plants that are well adapted to the specific locations involved. Often

times, re-vegetating an area with mature plants will fail, or be largely unsuccessful, due to the fact that the specific area will not support these plants, in spite of the fact they may be native to the area. During nesting season, we may continue to eradicate invasives through frill treatments, girdling a tree with a hatchet and applying Glyphosate to the wound. This will kill the trees, but leave them standing where they can be removed after nesting season, or if in a remote location, left to fall and decompose naturally. Due to the heavy infestation of invasives in the area, this project has been ongoing for about ten years and will continue for years to come as time, resources and volunteers allow. Because these invasives are so well adapted and established in this area, there will always be a need for control. Our primary work force will consist of volunteer workers, or personnel from American Youth Works, ECorps, and other groups provided by the Austin Parks Foundation. We will also typically have two FTEs on site, a Park Grounds Crewleader, and a Park Grounds Specialist. Their cost/day is $229.84. Currently Austin Parks Foundation is doing about 4 projects/year in the Greenbelt at a cost of about $4,000/workday, so we are spending about $1,000/year on FTEs, and the Austin Parks Foundation is spending $16,000/year.

Current City of Austin
Invasive Plant Programs & Projects Template

Department: SWS **Contact:** Jessica King/Melissa Prescott

Invasive Plant Project/ Program Name:
SWS has no direct role regarding removal/chipping. On occasion, they have received request from PARD to assist with collecting material that had been removed during one of the invasive species cleanups. Any material collected is taken to Hornsby for grinding.

Location(s): _____

Target Species:

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Existing Vegetation Surveys or Mapping: ____ Yes ____ No
If yes, please describe:

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Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

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Current City of Austin
Invasive Plant Programs & Projects Template

Department: Austin Police Department **Contact:** David Cudzilo

Invasive Plant Project/ Program Name: N/A

Location(s): _____

Target Species:

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Existing Vegetation Surveys or Mapping: ____ **Yes** ____ **No**
If yes, please describe:

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Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

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Current City of Austin
Invasive Plant Programs & Projects Template

Department: Community Court **Contact:** Pete Valdez

Invasive Plant Project/ Program Name: N/A

Location(s): _____

Target Species:

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Existing Vegetation Surveys or Mapping: ____ **Yes** ____ **No**
If yes, please describe:

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Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

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Current City of Austin
Invasive Plant Programs & Projects Template

Department: __EMS_____ **Contact:** __Vivian Holmes_____

Invasive Plant Project/ Program Name:
__None_____

Location(s): __None_____

Target Species:

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Existing Vegetation Surveys or Mapping: ____ **Yes** ____ **No**
If yes, please describe:

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Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)
__None_____

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Current City of Austin
Invasive Plant Programs & Projects Template

Department: _Austin Public Library_____ **Contact:** John W. Gillum (974-7495)_____

Invasive Plant Project/ Program Name: None at this time_____

Location(s): _____

Target Species:

_____

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Existing Vegetation Surveys or Mapping: __**X**__ **Yes** ____ **No**
If yes, please describe: _The Austin Public Library possesses landscaping plans for all sites in its inventory of property._____

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_____

Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

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Not applicable at this time._____

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Current City of Austin
Invasive Plant Programs & Projects Template

Department: __FIRE_____ **Contact:** _Greg Hager___974-4140__

Invasive Plant Project/ Program Name: _Not applicable to Fire_____

Location(s): _____

Target Species:

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Existing Vegetation Surveys or Mapping: ____ **Yes** __**X**_ **No**
If yes, please describe:

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Brief Description of Project/ Program:
(Please include sampling protocol, removal methods, other BMPs, project time frame, dedicated staff, complete cost of project including staff salary, removal and restoration efforts, etc.)

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Current City of Austin
Invasive Plant Programs & Projects Template

Department: Planning and Development Review

Contact: Keith Mars, Environmental Review Specialist Senior

Invasive Plant Project/ Program Name: None at this time.

Location(s): NA

Target Species: Non-native, invasive woody plants shown on tree surveys for development plans.

Existing Vegetation Surveys or Mapping: X Yes ____ No

If yes, please describe:
Both public and private development submittals are required to submit a tree survey, including trees that are non-native invasives, for the proposed site. Site plans require trees 8" and greater in diameter to be shown and single family lots require trees 19" diameter and greater to be shown. Tree surveys are submitted via hard copy and the newly implemented electronic submittal program.

Brief Description of Project/ Program:
Planning and Development Review (PDR) is not directly involved in invasive species removal and management. Rather, PDR's primary relevance to this issue is through regulating both public and private development activities. Consequently, PDR does not have an integrated pest management (IPM) plan, invasive species removal procedures, etc. as we do not directly manage lands. However, there are many opportunities for PDR to take a more active role in non-native, invasive species management.

Through regulating development, PDR's Land Use Review (LUR) Division and City Arborist Department currently require mitigation (i.e., replacement trees) for invasive species removal. With forthcoming Environmental Criteria Manual (ECM) revisions, LUR review staff will have rules in place that encourage and, in some cases, require invasive species removal as part of the application approval process. It is anticipated that new regulations will require management of non-native, invasive woody species by requiring appropriate removal without mitigation. LUR is also in the process of revising the regulatory landscape plant list, ECM Appendix N: City of Austin Preferred Plant List, and will ensure that no non-native, invasive plants are on the list.

Other opportunities to increase PDR's involvement in invasive species management is through ensuring all planning and design plans, such as Great Streets, ensures that no non-native, invasive species is on a planting list. Additionally, the Neighborhood Planning Section of PDR would have the opportunity to educate citizens about invasive species management as part of the parks, trees, and environment portion of formulating neighborhood plans. Invasive species management discussions may also be relevant to the environment and conservation element of the City's Comprehensive Plan process currently in progress.